Vulcain

Division of BW Technologies

VA901T

Gas Detector

Applications 2776-2779

USER MANUAL

ISO 9001:2000 CERTIFICATION Intertek

Protecting your health and your environment

Table of Contents

WARRANTY AND LIMITS OF LIABILITY 1
UNPACKING 2
DESCRIPTION 2
INSTALLATION GUIDELINES 2
SPECIFICATIONS 3
DETERMINING THE NUMBER OF TRANSMITTERS 4
SURFACE MOUNT INSTALLATION 4
RANGE AND ALARM LEVELS 5
WIRING DETAILS 6
electrical wiring 6
WIRING REQUIREMENTS 7
TYPICAL NETWORK DIAGRAM 7
EOL NETWORK DIAGRAM 8
KEY FUNCTION 9
Zero key 9
Span key 9
DEVICE COMMUNICATION 10
Dip Switch Settings 10
STRATEGIES 11
OTHER FUNCTIONS 12
POINT DEFINITIONS 18
PERIODIC INSPECTION AND CALIBRATION 21
MAINTENANCE 21

WARRANTY AND LIMITS OF LIABILITY

Vulcain warrants to the original purchaser that its product, and the component parts thereof, will be free from defects in workmanship and materials for a period of one year from the date of purchase. Vulcain will, without any charge and at its option, repair or replace defective products or components upon their delivery to its Repair and Service Department. This warranty does not apply in the event of misuse or abuse of the product, or as a result of unauthorized alterations or repairs. Vulcain shall not be liable for any consequential damages, including, without limitation, damages resulting from loss of use.

Every precaution for accuracy has been taken in the preparation of this manual. However, Vulcain neither assumes responsibility for any omissions or errors that may appear, nor liability for any damages that may result from the use of the products in accordance with the information contained in this manual.

To obtain warranty service, return the product, along with a complete description of the defect, transportation prepaid. Vulcain assumes no risk for damage in transit. Following warranty repair, the product will be returned to the buyer, transportation prepaid.

Vulcain
Division of BW Technologies

Technical Support Line: 1-800-563-2967
Before returning a product for warranty service, please contact Vulcain's Technical Support Department.

Warranty Registration

To validate the warranty, this registration form must be completed in full and sent to Vulcain within 90 days of the date of purchase. Fax it to Vulcain at 1 888 967-9938.

Customer's name:	
Address:	
City	State/Province:
Location of installation:	
Serial number:	

BEFORE RETURNING ANY INSTRUMENTS, PLEASE CONTACT US TO OBTAIN A RETURN OF MATERIAL AUTHORIZATION NUMBER.

UNPACKING

After opening the package and removing the equipment and components, make sure that you have all the items described on the order form or packing slip.

DESCRIPTION

The VA901T Detector is a gas detection device built, sold, and serviced by Vulcain. Vulcain offers a built-in Floor Level Network (FLN) communication driver and point database allowing the detector to coexist on an APOGEE network with other FLN devices. This document describes how the VA901T can be accessed through a field panel and how it can be used as a part of a larger control scheme.

The VA901T can be shipped with one of four sensor types: CO, O_2, NO_2, and combustibles.

INSTALLATION GUIDELINES

A Vulcain representative is responsible for proper configuration of the detector for its primary application, while a Siemens Building Technologies representative is responsible for field panel programming, to make use of the detector's functionality in the building automation system. As such, there must be coordination between Vulcain and Siemens Building Technologies representatives to ensure that programming of the VA901T is consistent with requirements for field panel programming.

- Make sure to locate the detector and sensing assembly(ies) in an area easily accessible to a technician.
- Avoid any location where the detector could be subject to vibrations.
- Avoid any location close to noisy equipment.
- Avoid any location where temperature changes occur rapidly.
- Verify all the requirements and existing regulations which may affect the choice of location.

SPECIFICATIONS

Power Requirements:	17 - 26 Vac, 100 mA @ 24 Vdc
Operating Temperature Range:	-40°F to 122°F (-40°C to 50°C)
Operating Humidity Range:	0% to 95% RH Non-condensed
Sensing Technologies:	Q1: electrochemical (toxic) catalytic combustion (combustible) diffusion fuel cell (oxygen)
Visual Indicators:	Green LED: Full = Normal operation Slow blink = Zero calibration mode Fast blink = Span calibration mode
Communication (length of lines):	Up to 2000 feet (600 m) per channel T-tap: 65 feet (20 m) maximum per t-tap 130 feet (40 m) total
Minimum size Conductors:	Twisted & shielded pair 24AWG wires
Storage Temperature:	32°F to 68°F (0°C to 20°C)
Communication:	RS-485 two wires
Communication Protocol:	Autodetect FLN
Sensor types:	CO - Carbon monoxide (application 2779) O2 - Oxygen (application 2778) NO2 - Nitrogen dioxide (application 2776) Combustibles (application 2777)
Transmission Speed:	4800 bps, half duplex, 8 bits of data, 1 stop bit
Dimensions:	6.1 x 5 x 2.3 in. / 15.25 x 12.5 x 5.75 cm
Weight:	1.65 lb. (750 g)

DETERMINING THE NUMBER OF TRANSMITTERS

The number of transmitters required is determined by a unit's operational surveillance radius. Using the table below, the number of units required can be easily evaluated.

Gas Detected		Surveillance Radius	Area Covered
CO	Carbon monoxide	50 feet (7 m)	7,854 sq. ft. (707 sq. m)
O_2	Oxygen	23 feet (7 m)	1,257 sq. ft (154 sq. m)
NO_2	Nitrogen dioxide	50 feet (15 m)	7,854 sq.ft (707 sq. m)
Comb	Combustible	23 feet (7 m)	1,257 sq. ft (154 sq. m)

SURFACE MOUNT INSTALLATION

Installation simply requires the physical mounting of the enclosure and connection of the power and output lines.

Recommended Height

Gas Detected		Relative Density (air = 1)	Height
CO	Carbon monoxide	0.968	3 - 5 feet (1 - 1.5m) from floor
O_2	Oxygen	1.43	3-5 ft (1-1.5m) from floor
NO_2	Nitrogen dioxide	1.58 (cold)	1-3 ft (30cm - 1m) from ceiling[a]
Comb	Most combustibles are heavier than air, with the exception of methane, hydrogen, ethylene and acetylene. For gases that are heavier than air, sensors should be installed approximately 30 cm (1 ft) from the floor. For combustibles that are lighter that air, sensors should be installed 30 cm (1 ft) from the ceiling, close to the potential leak source.		

a. May differ in certain applications: Hot NO_2 from exhaust systems is lighter than ambient air.

Combustible Interfering Gases Sensor

Gas	Catalytic factor (1)	**Gas**	Catalytic factor (1)
Acetone	2.208	Hydrogen	1.233
Acetylene	1.665	Isopropyl alcohol	2.582
Butane	--	Methane	1.000
Cyclohexane	2.492	Methylethyl ketone	2.631
Ethylacetate	2.563	Octane	--
Ethylene	1.537	Pentane	--
Heptane	--	Propane	1.883
Hexane	--	Toluene	2.470
		Enleaded petrol	--

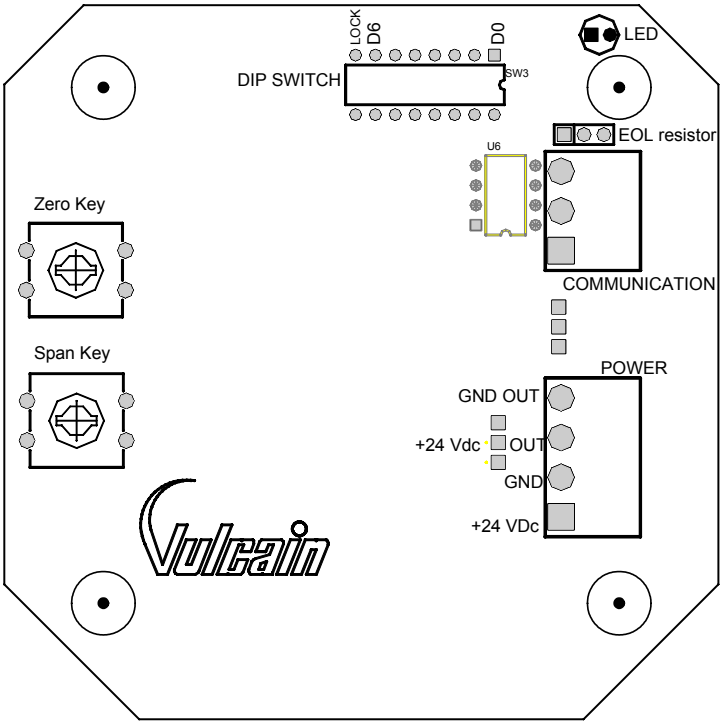
RANGE AND ALARM LEVELS

Range and Alarm Levels (Factory setting)

Detected Gas		Range	ALR LO MIN	ALR LO MAX	ALR HI MIN	ALR HI MAX
CO	Carbon monoxide	0-250ppm	20 ppm	25 ppm	180 ppm	200 ppm
O_2	Oxygen	0-25.5 % vol	20.0% vol	19.5% vol	21.5% vol	22.0% vol
NO_2	Nitrogen dioxide	0-10.2ppm	0.6ppm	0.7ppm	1.0ppm	2.0ppm
COMB	Combustibles	0-102% LEL	20.0% LEL	25.0% LEL	45.0% LEL	50.0% LEL

WIRING DETAILS

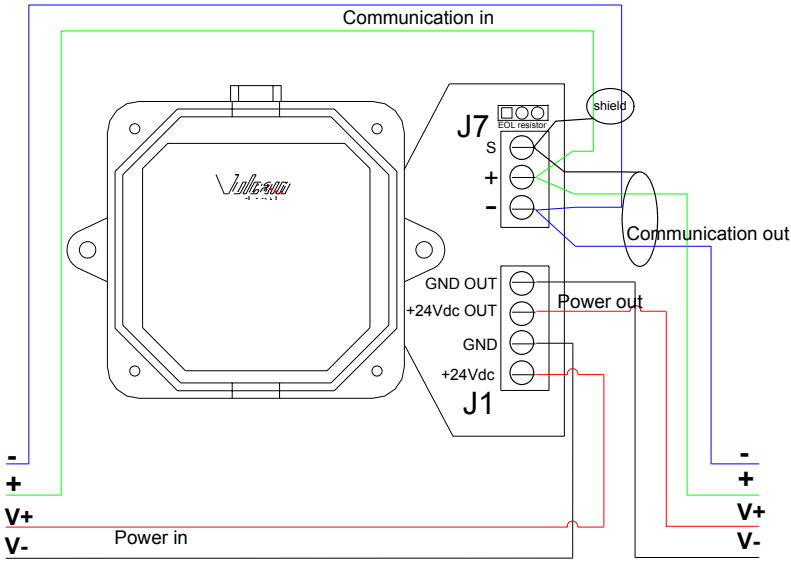
ELECTRICAL WIRING



This drawing provides an overview of how the VA901T circuit board looks when the unit is open. Consult the detailed wiring diagram on the next page for precise diagrams for wiring power and communications.

WIRING REQUIREMENTS

TYPICAL NETWORK DIAGRAM



The diagram above illustrates the wiring technique for the VA901T in a network setting.

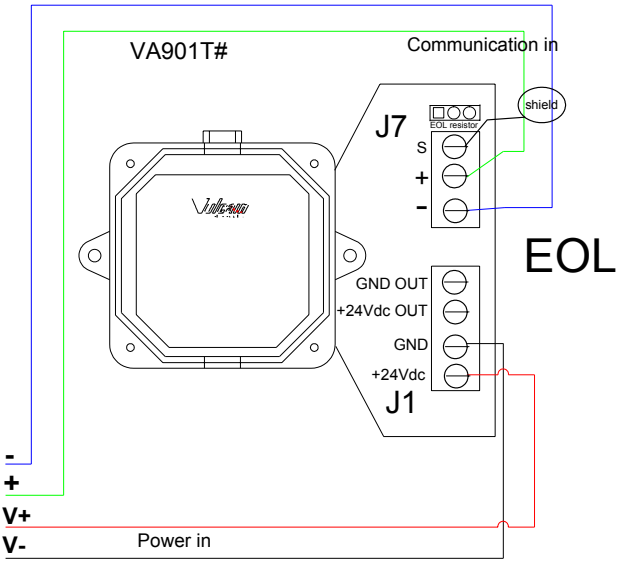
J1 Power: Illustrates both incoming and outgoing power connections.

J7 Communication: Illustrates both incoming and outgoing communication connections.

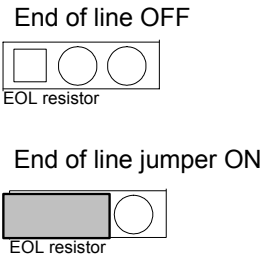
When wiring one of many units in a network, the wiring runs out from one unit and in to the next unit until the End of Line (EOL) unit is reached.

EOL NETWORK DIAGRAM

The End of Line, or EOL, wiring of a unit on a network means that there is no other unit connected to the network beyond this point. The unit is, thus, End of Line and there are no further connections to make.



The unit that is destined to be End-Of-Line is preset at the factory and labeled EOL. Simply remove the jumper from the resistor pins to remove the EOL termination from the unit or place the jumper over the first two resistor pins to make the unit the EOL, as shown in the following drawing.



KEY FUNCTION

The circuit board offer two buttons, or switches, each performing a specific function:

Zero key

The zero key provides the unit with the zero reference. This function must be performed without any calibration gas connected. To unlock the function, put switch D7 (lock) in the OFF position (see wiring details). This activates the calibration. By pressing the Zero key, the calibration will be activated and the LED will blink slowly for 15 to 30 seconds. The LED will stop blinking when the calibration is complete.

Span key

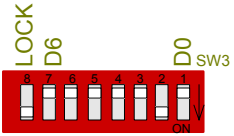
This function calibrates the sensor span. The calibration gas must be connected to the unit. To unlock the function, put switch D7 (lock) in the OFF position (see wiring details). By pressing the span key, the calibration will be activated and the LED will blink quickly for 1 to 2 minutes. The LED will stop blinking when the calibration is complete.

DEVICE COMMUNICATION

This device is a slave device must be integrated into a Floor Level Network, called FLN, with a master (controller, software, etc.). Vulcain devices respond to P1 commands.

Dip Switch Settings

The detector address is selected (in binary format) with dip switches D6 to D0 (MSB to LSB) on SW3.



The dip switch is labeled 1 through 8. Switch 8 (binary value D7 on the circuit board) is the assigned "LOCK" switch, which locks the Zero and Span keys to prevent accidental activation. Switches labeled 1 through 7 each represent a binary value on the circuit board (D0 to D6). Each of these switches is associated to a value, known as a "weight", assigned to its ON position (the OFF position has no value), as shown in the table below:

Switch Number	Binary PCB number	Value
1	D0	1
2	D1	2
3	D2	4
4	D3	8
5	D4	16
6	D5	32
7	D6	64

These possible combinations of switch settings allow for up to 128 addresses, as in this example if:

Switch D3: ON = 4
Switch D4: ON = 8
Switch D6: ON = 64

Add the values of all the switches that are on to obtain the device's address (4+8+64=76). If all the switches are in the ON position, the maximum address value would be 127, however, the FLN protocol only supports address values from 1 to 98. Address 99 is reserved for backdoor access (remote calibration, etc.). All address values above 98 will be defaulted to the backdoor address value. Address 127 is reserved for Vulcain programming use.

The detector's address is updated only at startup, which means that you will have to cut power to the device and power up again. A firmware (P1 command) or can also be used to validate a new address.

STRATEGIES

Monitoring	Several detector parameters are available for monitoring purposes. These include GAS CONC (Point 4), ALR LO FLAG (Point 90) and ALR HI FLAG (Point 91). These points can be unbundled for monitoring or used in various global control strategies.
Monitoring Alarm LDIs	ALR LO FLAG (Point 90) and ALR HI FLAG (Point 91). These flags are ON when the gas concentration exceeds alarm levels. For example, these flags can be used to start ventilation or activate a buzzer.

OTHER FUNCTIONS

Set zero — CMD SET ZERO (Point 23) is the command used to calibrate the zero of the sensor, which is the reference for the detector when no GAS is present. When ordered, this point will return to STOP by itself and it's initial value cannot be changed.

NOTE: This command will affect the detector's calibration.

Set span — CMD SET SPAN (Point 22) is the command used to calibrate the sensor with a specific gas concentration. The concentration applied to the detector is specified in the GAS SPAN (Point 6) field. When ordered, this point will return to STOP by itself and it's initial value cannot be changed.

NOTE: This command will affect the detector's calibration.

Analog Inputs — SENSOR TYPE (point 3) shows the gas type detected by the detector, according to the table below:

SENSOR TYPE	Target Gas	
2	CO	Carbon monoxide
3	O2	Oxygen
5	NO2	Nitrogen dioxide
20	COMB	Combustible gases

Other analog inputs include: GAS CONC (point 4) shows the current gas concentration. SENSOR TEMP (point 11) gives the temperature inside the detector. RUN TIME (point 12) is the number of days the sensor has been on.

Digital Inputs

ALR LO FLAG (Point 90) and ALR HI FLAG (Point 91) are the main physical DIs on the VA901T. They correspond to a specific gas concentration limit. the low level, ALR LO FLAG (point 90), is set when the gas concentration reaches the ALR LO MAX level (point 8), and cleared when the gas concentration returns under the ALR LO MIN level (point 7). In the same way, the high level alarm, ALR HI FLAG (point 91) is set when the gas concentration reaches the ALR HI MAX level (point 10) and cleared when the gas concentration is lower than ALR HI MIN (point 9).

Example for Oxygen sensor: Normally, there is 20.9% VOL of oxygen in the air. It is good practice to detect when there is too much oxygen (ALR HI FLAG) and when there is not enough (ALR LO FLAG). The ALR HI FLAG works as described in the previous paragraph. However, for the ALR LO FLAG, the MIN value must be higher that the MAX value for proper use. This instruction tells the detector to use negative trig for this flag (normally used when the alarm level is under the normal concentration). In such a case, the current flag will be set when the oxygen concentration is under the MAX level and is cleared when the concentration rises above the MIN value.

Address limitations

The default value for CTLR ADDRESS (Point 1) is 99 - the maximum address value allowed in the FLN specifications

Point Data base for Nitrogen dioxide.

Point Number	Point Type	Subpoint Name	Factory Default (SI Units)	Emgr Units	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	LAO	CTRL ADDRESS	99	-	1	0	-	-
02	LAO	APPLICATION	2776	-	1	0	-	-
03	LAI	SENSOR TYPE	0	-	1	0	-	-
{04}	LAI	GAS CONC	0	ppm	0.1	0	-	-
05	LAI	FULL SCALE	0	PPM	0.1	0	-	-
06	LAO	GAS SPAN	0	PPM	0.1	0	-	-
07	LAO	ALR LO MIN	0	PPM	0.1	0	-	-
08	LAO	ALR LO MAX	0	PPM	0.1	0	-	-
09	LAO	ALR HI MIN	0	PPM	0.1	0	-	-
10	LAO	ALR HI MAX	0	PPM	0.1	0	-	-
11	LAI	SENSOR TEMP	0	DEG F (DEG C)	0.18 (0.1)	-40	-	-
12	LAI	RUN TIME	0	DAYS	1	0	-	-
13	LAI	ADC FULL	4095	ADC	1	0	-	-
14	LAI	ADC ZERO	0	ADC	1	0	-	-
20	LAO	OVRD TIME	1	-	1	0	-	-
22	LDO	CMD SET SPAN	STOP	-	-	-	START	STOP
23	LDO	CMD SET ZERO	STOP	-	-	-	START	STOP
{29}	LDO	DAY.NIGHT	DAY	-	-	-	NIGHT	DAY
{90}	LDI	ALR LO FLAG	NORMAL	-	-	-	RUN	NORMAL
{91}	LDI	ALR HI FLAG	NORMAL	-	-	-	START	NORMAL
92	LDI	SNS WARM UP	READY	-	-	-	WARMUP	READY
{94}	LDO	RESET FAULT	NORMAL	-	-	-	RESET	NORMAL
{99}	LAI	ERROR STATUS	0	-	1	0	-	-

NOTE: Points not listed are not used in this application. A single value in a column means that the value is the same in English units and in SI units. Point numbers that appear in brackets {} may be unbundled at the field panel.

Point Data base for Application Combustibles.

Point Number	Point Type	Subpoint Name	Factory Default (SI Units)	Emgr Units	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	LAO	CTRL ADDRESS	99	-	1	0	-	-
02	LAO	APPLICATION	2777	-	1	0	-	-
03	LAI	SENSOR TYPE	0	-	1	0	-	-
{04}	LAI	GAS CONC	0	PCTLEL	0.1	0	-	-
05	LAI	FULL SCALE	0	PCTLEL	0.1	0	-	-
06	LAO	GAS SPAN	0	PCTLEL	0.1	0	-	-
07	LAO	ALR LO MIN	0	PCTLEL	0.1	0	-	-
08	LAO	ALR LO MAX	0	PCTLEL	0.1	0	-	-
09	LAO	ALR HI MIN	0	PCTLEL	0.1	0	-	-
10	LAO	ALR HI MAX	0	PCTLEL	0.1	0	-	-
11	LAI	SENSOR TEMP	0	DEG F (DEG C)	0.18 (0.1)	-40	-	-
12	LAI	RUN TIME	0	DAYS	1	0	-	-
13	LAI	ADC FULL	4095	ADC	1	0	-	-
14	LAI	ADC ZERO	0	ADC	1	0	-	-
20	LAO	OVRD TIME	1	-	1	0	-	-
22	LDO	CMD SET SPAN	STOP	-	-	-	START	STOP
23	LDO	CMD SET ZERO	STOP	-	-	-	START	STOP
{29}	LDO	DAY.NIGHT	DAY	-	-	-	NIGHT	DAY
{90}	LDI	ALR LO FLAG	NORMAL	-	-	-	RUN	NORMAL
{91}	LDI	ALR HI FLAG	NORMAL	-	-	-	START	NORMAL
92	LDI	SNS WARM UP	READY	-	-	-	WARMUP	READY
{94}	LDO	RESET FAULT	NORMAL	-	-	-	RESET	NORMAL
{99}	LAI	ERROR STATUS	0	-	1	0	-	-

Points not listed are not used in this application. A single value in a column means that the value is the same in English units and in SI units. Point numbers that appear in brackets { } may be unbundled at the field panel.

Point Data base for Oxygen.

Point Number	Point Type	Subpoint Name	Factory Default (SI Units)	Emgr Units	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	LAO	CTRL ADDRESS	99	-	1	0	-	-
02	LAO	APPLICATION	2778	-	1	0	-	-
03	LAI	SENSOR TYPE	0	-	1	0	-	-
{04}	LAI	GAS CONC	0	PCTVOL	0.1	0	-	-
05	LAI	FULL SCALE	0	PCTVOL	0.1	0	-	-
06	LAO	GAS SPAN	0	PCTVOL	0.1	0	-	-
07	LAO	ALR LO MIN	0	PCTVOL	0.1	0	-	-
08	LAO	ALR LO MAX	0	PCTVOL	0.1	0	-	-
09	LAO	ALR HI MIN	0	PCTVOL	0.1	0	-	-
10	LAO	ALR HI MAX	0	PCTVOL	0.1	0	-	-
11	LAI	SENSOR TEMP	0	DEG F (DEG C)	0.18 (0.1)	-40	-	-
12	LAI	RUN TIME	0	DAYS	1	0	-	-
13	LAI	ADC FULL	4095	ADC	1	0	-	-
14	LAI	ADC ZERO	0	ADC	1	0	-	-
20	LAO	OVRD TIME	1	-	1	0	-	-
22	LDO	CMD SET SPAN	STOP	-	-	-	START	STOP
23	LDO	CMD SET ZERO	STOP	-	-	-	START	STOP
{29}	LDO	DAY.NIGHT	DAY	-	-	-	NIGHT	DAY
{90}	LDI	ALR LO FLAG	NORMAL	-	-	-	RUN	NORMAL
{91}	LDI	ALR HI FLAG	NORMAL	-	-	-	START	NORMAL
92	LDI	SNS WARM UP	READY	-	-	-	WARMUP	READY
{94}	LDO	RESET FAULT	NORMAL	-	-	-	RESET	NORMAL
{99}	LAI	ERROR STATUS	0	-	1	0	-	-

Points not listed are not used in this application. A single value in a column means that the value is the same in English units and in SI units. Point numbers that appear in brackets { } may be unbundled at the field panel.

Point Data base for Carbon monoxide.

Point Number	Point Type	Subpoint Name	Factory Default (SI Units)	Emgr Units	Slope (SI Units)	Intercept (SI Units)	On Text	Off Text
01	LAO	CTRL ADDRESS	99	-	1	0	-	-
02	LAO	APPLICATION	2779	-	1	0	-	-
03	LAI	SENSOR TYPE	0	-	1	0	-	-
{04}	LAI	GAS CONC	0	PPM	1	0	-	-
05	LAI	FULL SCALE	0	PPM	1	0	-	-
06	LAO	GAS SPAN	0	PPM	1	0	-	-
07	LAO	ALR LO MIN	0	PPM	1	0	-	-
08	LAO	ALR LO MAX	0	PPM	1	0	-	-
09	LAO	ALR HI MIN	0	PPM	1	0	-	-
10	LAO	ALR HI MAX	0	PPM	1	0	-	-
11	LAI	SENSOR TEMP	0	DEG F (DEG C)	0.18 (0.1)	-40	-	-
12	LAI	RUN TIME	0	DAYS	1	0	-	-
13	LAI	ADC FULL	4095	ADC	1	0	-	-
14	LAI	ADC ZERO	0	ADC	1	0	-	-
20	LAO	OVRD TIME	1	-	1	0	-	-
22	LDO	CMD SET SPAN	STOP	-	-	-	START	STOP
23	LDO	CMD SET ZERO	STOP	-	-	-	START	STOP
{29}	LDO	DAY.NIGHT	DAY	-	-	-	NIGHT	DAY
{90}	LDI	ALR LO FLAG	NORMAL	-	-	-	RUN	NORMAL
{91}	LDI	ALR HI FLAG	NORMAL	-	-	-	START	NORMAL
92	LDI	SNS WARM UP	READY	-	-	-	WARMUP	READY
{94}	LDO	RESET FAULT	NORMAL	-	-	-	RESET	NORMAL
{99}	LAI	ERROR STATUS	0	-	1	0	-	-

Points not listed are not used in this application. A single value in a column means that the value is the same in English units and in SI units. Point numbers that appear in brackets {} may be unbundled at the field panel.

POINT DEFINITIONS

Point 01 CTLR ADDRESS
This point contains the device address. The default value is 99 (Backdoor address), however, the initial value is set on the hardware (Dip Switch SW3). The detector always answers to adress 99. This point cannot be changed by software (P1 Command) and a reset of the unit is needed to update the value of this register (reset can be done with a P1 command).

Point 02 APPLICATION
This point shows the current application number for this product.

Point 03 SENSOR TYPE
This point shows the gas type detected by the detector.

Point 04 GAS CONC
The gas concentration can be read with this point. It shows the current gas concentration of its surveillance area.

Point 05 FULL SCALE
This status point shows the maximum limit (concentration) of the detection range.

Point 06 GAS SPAN
This point contains the concentration of the gas used for the span calibration.

Point 7-10 ALARM PNT
These points specify alarm levels. Refer to Digital Inputs on page 17 for more detail.

Point 11 SENSOR TEMP
Shows the temperature inside the detector.

Point 12 CO RUN TIME
This point shows the running time (in days) of the sensor. The point is reset to default value (0) when a 'Factory Reset' is ordered.

Point 20 OVRD TIME
Used to count the time the device is in 'override' mode.

Point 22 CMD SET SPAN
This point is used for the span calibration. When this point is ordered (value is 'START'), the device will calibrate its reading with the gas specified in the GAS SPAN point and the concentration read by the detector. When done, the point returns to STOP by itself.

NOTE: This command will affect the detector's calibration.

Point 23 CMD SET ZERO
This point is used for the zero calibration. When done, the point returns to STOP by itself. Note: Setting this point to STOP, from the START position, will cancel the calibration.

NOTE: This command will affect the detector's calibration.

Point 29 DAY.NIGHT
This point tells the detector to run in day or night mode. These modes are not supported by the detector.

Point 90 - 91 ALR LO FLAG and ALR HI FLAG
This points shows the status of the corresponding alarm level.

Point 92 SNS WARMUP
This point shows if the sensor is in warmup mode and returns to “ready” when the sensor has finished the warmup. Avoid calibration during warmup.

NOTE: Not all sensors require a warmup period.

Point 94 RESET FAULT
This point can be used as a LDO for detecting 'not Commanded Reset'. Set the initial value to RESET and set the current value to NORMAL. When a reset appends, this point will toggle to RESET.

Point 99 ERROR STATUS
This point shows current errors on the detector. See the table below for details

Fault:
ERROR STATUS (Point 99).
This point uses a bit field definition as described below. When the sensor is NOT calibrated, bit B2 is set. B3 is for sensor related error. Ex.: eprom life has expired. Service Alarm bit (B5) will be set after 15 months without calibration.

Error Status Point Descriptions

Bit	If Set
B0	Read as “0”
B1	Read as “0”
B2	Sensor not calibrated
B3	Sensor error
B4	CPU error
B5	Service alarm
B6	Read as “0”
B7	Read as “0”

PERIODIC INSPECTION AND CALIBRATION

This unit requires calibration. The calibration frequency will be determined by the operating conditions, which includes extreme temperatures, exposure to contaminants or gas. If the exposure to the gas is greater than the unit's full scale, the unit must be recalibrated. A calibration inspection must be included as part of a routine maintenance to ensure proper operation of the gas detection unit.

WARNING: If the unit's span or zero cannot be adjusted, the sensor may be approaching its end-of-life and have been contaminated with high concentration of gas, and it must be replaced.

MAINTENANCE

The VA901T will provide years of service with minimal care. Encapsulated electronic plug-in modules are protected from moisture and corrosive environments.

1 Visually inspect, test and calibrate with gas at regular intervals to ensure optimum operating condition periods.
2 An accurate maintenance log of all maintenance, calibration and occurences must be kept for the proper service of this product.

NOTE: Do not expose the sensor to high pressure water spray. Sensors should not be exposed to solvents.